FILED
JAN 21 200

No. 02-271

IN THE

Supreme Court of the United States

DOW CHEMICAL COMPANY, MONSANTO COMPANY, *et al.*,

Petitioners,

v.

DANIEL RAYMOND STEPHENSON, SUSAN STEPHENSON, DANIEL ANTHONY STEPHENSON, EMILY ELIZABETH STEPHENSON, JOE ISAACSON, and PHYLLIS LISA ISAACSON,

Respondents.

ON WRIT OF CERTIORARI TO THE
UNITED STATES COURT OF APPEALS FOR THE SECOND CIRCUIT

BRIEF *AMICI CURIAE* OF THE LYMPHOMA FOUNDATION OF AMERICA, CARL F. CRANOR, DEVRA DAVIS, PETER L. DEFUR, BRIAN G. DURIE, ALAN H. LOCKWOOD, DAVID OZONOFF, ARNOLD J. SCHECTER, AND DAVID WALLINGA IN SUPPORT OF RESPONDENTS

RAPHAEL METZGER
LAW OFFICES OF RAPHAEL METZGER,
A PROFESSIONAL LAW CORPORATION
Attorneys for Amici Curiae
401 East Ocean Boulevard
Suite 800
Long Beach, CA 90802
(562) 437-4499

178671

COUNSEL PRESS
(800) 274-3321 • (800) 359-6859

TABLE OF CONTENTS

Page

Table of Cited Authorities iii

Interest of Amici 1

Statement of Facts 3

Summary of Argument 4

Argument 6

I. ALTHOUGH THERE WAS NOT THEN A SCIENTIFIC CONSENSUS THAT THE HERBICIDES IN AGENT ORANGE CAUSED CANCER, BY 1984 THERE WAS ENOUGH MEDICAL EVIDENCE POINTING TO THE PLAUSIBILITY OF SUCH A RELATIONSHIP THAT ANYONE ADEQUATELY REPRESENTING VETERANS WHO HAD NOT YET DEVELOPED CANCER WOULD HAVE VIGOROUSLY FOUGHT TO PRESERVE THEIR RIGHT TO BRING CLAIMS IN THE FUTURE WHEN DISEASES LATER DEVELOPED. 6

II. WITH THE DEVELOPMENT OF A LARGE BODY OF LITERATURE DURING THE PAST 20 YEARS AS LATENCIES FOR RELATED DISEASES HAVE NOW BEEN APPROACHED, A GENERAL CONSENSUS NOW EXISTS THAT PHENOXY HERBICIDE EXPOSURE IS LINKED TO CERTAIN CANCERS, PARTICULARLY LYMPHOMAS, INCLUDING NON-HODGKIN'S LYMPHOMAS, HODGKIN'S LYMPHOMAS, AND MULTIPLE MYELOMA. 11

Contents

		Page
A.	The Congressional Mandate to Research Agent Orange Disease and the Institute of Medicine	12
B.	Conclusions of the Institute of Medicine of the National Academy Of Sciences	14
C.	The Department of Veterans Affairs' Review of the National Academy of Sciences Report	15
D.	The Carcinogenicity of Dioxin	16
III.	THE CANCERS AT ISSUE HERE ARE CANCERS OF THE LYMPHOPOIETIC SYSTEM AND THUS IT BIOLOGICALLY PLAUSIBLE THAT HERBICIDES WOULD BE LIKELY TO PRODUCE CELLULAR INJURY IN EACH TYPE OF LYMPHOID CELL.	17
A.	The Epidemiology of Herbicide-Induced Non-Hodgkin's Lymphoma	21
B.	The Epidemiology of Herbicide-induced Multiple Myeloma	23
Conclusion		27
Appendix		1a

TABLE OF CITED AUTHORITIES

Page

Cases

Daubert v. Merrell Dow Pharmaceuticals, 113 S. Ct. 2786 (1993) 13

Statutes

38 U.S.C. § 1116(b)(2) 15

Agent Orange Act of 1991, Pub. L. No. 102-4, § 3, 105 Stat. 11 (codified as amended at 38 U.S.C. § 1116 (1991) 12

Regulations

38 C.F.R. § 3.309 16

59 Fed. Reg. 5,161-62 16

Publications

Bishop, C.M., et al., "Non-Hodgkin Lymphoma of the Scalp in Workers Exposed to Dioxins," Lancet 2:369 (1981) 8

Burns, C.J., et al., "Mortality in chemical workers potentially exposed to 2,4-dichloro-phenoxyacetic acid (2,4-D) 1945-94: an update," *Occup. Environ. Med.* 58:24-30 (2001) 23

Page

Cantor, K.P, "Farming and Mortality from Non-Hodgkin's Lymphoma: A Case-control Study," *Int. J. Cancer* 29:239-247 (1982) 8

Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam* (National Academy Press, Washington, D.C. 1994) ...21, 24, 25

Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 1996* (National Academy Press, Washington, D.C. 1996) 21-22

Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 1998* (National Academy Press, Washington, D.C. 1999) 22

Page

Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 2000* (National Academy Press, Washington, D.C. 2000) 22, 25

Daller, M.F., *Tort Law Desk Reference: A Fifty-State Compendium* (Aspen 2001) 10

Hardell, L., "Malignant Lymphoma and Exposure to Chemicals, Especially Organic Solvents, Chlorophenols and Phenoxy Acids: A Case-Control Study," *British J. Cancer* 43:169-176 (1981) 7, 8

Hardell, L., "Malignant Lymphoma of Histiocytic Type and Exposure to Phenoxyacetic Acids or Chlorophenols," *Lancet* Jan. 6, 1979 7

Hardell, L., "Relation of Soft-Tissue Sarcoma, Malignant Lymphoma and Colon Cancer to Phenoxy Acids, Chlorophenols, and Other Agents," *Scand. J. Work Environ. Health* 7:119-130 (1981) 7, 8

Hoar, S.K., "Agricultural Herbicide Use and Risk of Lymphoma and Soft-Tissue Sarcoma, *J. Amer. Med. Assoc.* 256:1141-47 11

Cited Authorities

Page

Kociba, R.J., et al., "Results of a two-year chronic toxicity and oncogenicity study of 2,3,7,8-tetrachlorodibenzen-p-dioxin in rats." *Toxicol. Applied Pharmacol.* 469:179-303 (1978) 7

McDuffie, H., "Non-Hodgkin's Lymphoma and Specific Pesticide Exposures in Men: Cross-Canada Study of Pesticides and Health," *Cancer Epidemiology, Biomarkers & Prevention* 10:1155-1163 (2001) 22-23

Morrison, H.I., et al., "Review: Herbicides and Cancer," *J. Nat'l Cancer Inst.* 84:1866-1874 (1992) 11, 12

Olsson, H., "Non-Hodgkin's Lymphoma of the Skin and Occupational Exposure to Herbicides, *Lancet*, Sept. 12, 1981 ..... 7, 8

Peter H. Schuck, Agent Orange on Trial: Mass Toxic Disasters in the Courts 24 (1986) 16

Thörn, Ä., et al., "Mortality and cancer incidence among Swedish lumberjacks exposed to phenoxy herbicides," *Occup. Environ. Med.* 57:718-720 (2000); Burns, C.J., et al., "Mortality in chemical workers potentially exposed to 2,4-dichlorophenoxyacetic acid (2,4-D) 1945-94: an update," *Occup. Environ. Med.* 58:24-30 (2001) 22-23

Cited Authorities

Page

US DHHS, *Tenth Annual Report on Carcinogens* (2002) 17

WHO and IARC, IARC *Monographs on the Evaluation of Carcinogenic Risks to Humans: Polychlorinated Dibenzo-para-Dioxins and Polychlorinated Dibenzofurans* (1997) 17

INTEREST OF AMICI[1]

Amici, Carl F. Cranor, Devra Davis, Peter L. deFur, Brian G. Durie, Alan H. Lockwood, David Ozonoff, David Wallinga, and the Lymphoma Foundation of America, are physicians, scientists, scholars of science, and a public health organization.[2]

Amici are familiar with the methods and techniques by which physicians, scientists, and public health specialists assess adverse health outcomes from exposure to toxic substances, and Amici are engaged in the practice of fields of medical science in which such assessments are routinely required. As such, amici are familiar with the process and methods by which the scientific and medical community and governmental agencies make determinations regarding causal associations between exposure to particular substances and adverse health effects. None of the amici has any financial or other similar interest in the outcome of this lawsuit or any suits raising similar issues.

Amici appear in their own behalf to alert the Court to the substantial developments in medical knowledge and understanding of Agent Orange related disease since 1984 when the class action settlement at issue was entered. Amici are concerned that Petitioner chemical companies have used

---

1. This brief was not authored, in whole or in part, by counsel for any party. Other than the amici on whose behalf this brief is submitted, and their counsel, no person or entity made any monetary or other contribution to the preparation of this brief. The parties have consented to the filing of this brief.

2. The qualifications and positions held by amici are set forth in the appendix bound with this brief.

selected citations from the decisions below to lead the Court to believe that the epidemiologic and other scientific data is too undeveloped for medical science to assess causality for Agent Orange and particular diseases, especially non-Hodgkin's lymphoma and multiple myeloma. Equally importantly, Amici are deeply concerned that the chemical companies have given a false impression that all cases alleging an association between dioxin containing phenoxy herbicides and cancer are inherently "weak," because of a lack of credible causation evidence. [Petitioners' Brief at pp. 3, 10]

Amici take strong exception to these characterizations of the status of scientific assessment of the causal association between herbicides and cancer. As Amici will show, as a result of an overwhelming medical and scientific effort over the past 15 years or so, Agent Orange disease research is informed by an abundance of cohort,[3] case control,[4] and environmental epidemiologic studies,[5] and most particularly government funded review of these studies performed by the National Academy of Science, Institute of Medicine. Amici believe it is accurate to say that these reports powerfully demonstrate that the scientific community views the association between

3. The cohort studies include studies of production workers, agricultural and forestry workers, herbicide applicators, paper and pulp workers, and Vietnam Veterans.

4. The case control studies consider people who have died from or have been diagnosed with specific diseases (often cancer) and evaluate their histories to determine whether they had greater herbicide exposure than persons without the diseases.

5. The environmental studies assess disease in people exposed to herbicides in accidents or from farming.

herbicide exposure and several adverse health effects as being causal, and that the causal association for non-Hodgkin's lymphoma and multiple myeloma from herbicide exposure is much stronger than was perceived in 1984 based upon the limited data available at that time. Indeed, there is a high degree of scientific consensus that phenoxy herbicide expsures are causally associated with development of certain cancers such as Non-Hodgkin's Lymphoma, Hodgkin's disease, soft tissue sarcoma, and multiple myeloma. Welch Affidavit JA 298.

In sum, this brief will show that had a representative of veterans who had not yet manifested disease been properly appointed at the time of the proposed settlement, there was enough indication in the medical literature then to compel that representative to conclude that it was plausible that medical knowledge would continue to develop so that when future claims accrued there would be substantial medical proof to support them. Such a representative would then have been compelled to fight vigorously to preserve such claims so that they could be brought as diseases developed in the future and injury claims accrued under state law.

STATEMENT OF FACTS

Respondents Dan Stephenson and Joe Isaacson are Vietnam Veterans who were exposed to phenoxy herbicides in Agent Orange. After their service both veterans returned to private life and lived normal healthy lives, without evidence of any disease associated with Agent Orange. Tragically, both developed cancers associated with Agent Orange exposures after the Agent Orange settlement and after all settlement funds had been disbursed.

Agent Orange is an herbicidal chemical mixture that was used to defoliate jungle terrain and clear vegetation around enemy military installations in the Vietnam War. The name derives from the orange-identifying strip on drums in which the herbicide was stored. Agent Orange is a 1:1 mixture of the n-butyl esters of 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). A byproduct contaminant of the manufacturing process for 2,4,5-T is 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD), commonly referred to as dioxin.

Agent Orange was one of 15 herbicides sprayed in Vietnam although, due to its intensified usage, it is the herbicide most commonly associated with health problems of Vietnam Veterans. Some of the other herbicides used during the Vietnam War were Agent Purple (a mixture of 2,4,-D and 2,4,5,-T used between 1962 and 1964), Agent Green and Agent Pink, (each of which contained 2,4,5-T and was used between 1962 and 1964), Agent White (a 4:1 formulation of 2,4-D and Picloram), Agent Blue (which contained cacodylic acid), and Agent Orange II (a mixture of 2,4,-D and 2,4,5-T which was used in 1968 and 1969 and sometimes called "Super Orange").

SUMMARY OF ARGUMENT

Petitioner chemical companies have attempted to characterize the medical evidence of a causal relationship between the cancers now suffered by the Respondent veterans and their exposure to Agent Orange in Viet Nam as very weak when the case was settled in 1984 and have implied that medical knowledge more than 15 years later is no better in establishing such a relationship. Both characterizations are wrong.

We wish to focus the Court's attention on the evidence of a causal association between certain cancers and phenoxy herbicides that had already developed by the time of the settlement, even though latency periods for development of such cancers from agricultural and war time exposure were just being reached. As such, it would have been critically important that someone represent veterans who did not at that time have any cancer or other claim of injury from Agent Orange exposure. With knowledge of the developing body of medical evidence linking herbicide exposures and certain cancers, a competent representative of future disease claimants would have recognized that as the state of medical knowledge of Agent Orange induced disease progressed, Veterans later developing such diseases would be able to prove causation of their diseases by herbicide exposure at the time their diseases manifested and were diagnosed. As such, any adequate representative of future disease claimants, who was independent and without conflicts, would have vigorously fought to preserve those future claims and would not have accepted nuisance or de minimis settlements for future claims before they even accrued.

Moreover, in the past 15 years, despite the false implications by the chemical companies to the contrary, medical evidence of causality of herbicide induced lymphopoietic malignancies has become so robust that there is now a consensus among knowledgeable scientists and public health specialists a causal association exists between non-Hodgkin's lymphomas (including multiple myeloma) and exposure to Agent Orange and its contaminant dioxin. The cases presently before the court are thus by no means weak and these veterans will never obtain redress for their injuries unless they are allowed to persuade the Court that they have been deprived of Due Process and should be allowed to have their day in court.

ARGUMENT

I. Although There Was Not Then a Scientific Consensus That the Herbicides in Agent Orange Caused Cancer, by 1984 There Was Enough Medical Evidence Pointing to the Plausibility of Such a Relationship That Anyone Adequately Representing Veterans Who Had Not Yet Developed Cancer Would Have Vigorously Fought to Preserve Their Right to Bring Claims in the Future When Diseases Later Developed.

The development and use of phenoxyacetic acids as herbicides began towards the end of World War II. Widespread use in agriculture began in the early 1950s, so the first occupational exposures would have occurred during this time. Because cancers, especially lymphopoietic malignancies such as lymphomas and myelomas, have lengthy latency periods, such malignancies resulting from herbicide exposure would not be expected to occur for decades or more. As such, until at least three decades passed following first widespread use, without knowing what the companies themselves knew about worker illness or disease from exposures,[6] outside scientists and medical researchers would not likely have sufficient case reports and other data gathered to form any clear opinions about the relationship between human exposure to these herbicides and cancers such as non-Hodgkin's lymphoma and multiple myeloma.

6. While amici have not personally reviewed the documentary records produced in other herbicide litigation, they are aware that there is substantial documentation of inter-company studies and concerns raised about the toxicity of these products, and particularly about their contamination with dioxin.

An estimated 19 million gallons of Agent Orange were mixed, loaded, and sprayed in South Vietnam. With the widespread international use of these powerful chemicals in agriculture and the massive use of these potent chemicals during the Vietnam War, beginning in the early 1970s the medical and scientific community began directing its attention to determining whether adverse health effects were associated with these chemicals. The first independent studies investigated the epidemiology of herbicide sprayers and manufacturing workers. Welch Affidavit JA 295.

The first reported evidence of this linkage came from Sweden with clinical reports in the late 1970s by a group of Scandinavian physicians. *See, e.g.*, Hardell, L., "Malignant Lymphoma of Histiocytic Type and Exposure to Phenoxyacetic Acids or Chlorophenols," *Lancet* Jan. 6, 1979 at pp. 55-56; Olsson, H., "Non-Hodgkin's Lymphoma of the Skin and Occupational Exposure to Herbicides, *Lancet*, Sept. 12, 1981 at pp. 579-580. These were followed with epidemiological studies by the same group. *See* Hardell, L., "Malignant Lymphoma and Exposure to Chemicals, Especially Organic Solvents, Chlorophenols and Phenoxy Acids: A Case-Control Study," *British J. Cancer* 43:169-176 (1981); Hardell, L., "Relation of Soft-Tissue Sarcoma, Malignant Lymphoma and Colon Cancer to Phenoxy Acids, Chlorophenols, and Other Agents," *Scand. J. Work Environ. Health* 7:119-130 (1981).

At the same it was becoming accepted even among chemical company funded researchers that these phenoxy herbicides were contaminated with dioxin, a potent carcinogen. *E.g.*, Kociba, R.J., et al., "Results of a two-year chronic toxicity and oncogenicity study of 2,3,7,8-tetrachlorodibenzen-p-dioxin in rats." *Toxicol. Applied Pharmacol.* 469:179-303 (1978).[7]

7. The lead author and other authors on this study were Petitioner Dow employees and the work was funded by Petitioner Dow.

By 1984 there were thus a number of studies and reports which suggested there was a linkage between herbicide exposure and cancer. In particular there were a number of articles linking Respondent Isaacson's disease, non-Hodgkin's lymphoma, to phenoxy herbicide exposure. *E.g.*, Cantor, K.P, "Farming and Mortality from Non-Hodgkin's Lymphoma: A Case-control Study," *Int. J. Cancer* 29:239-247 (1982); Bishop, C.M., et al., "Non-Hodgkin Lymphoma of the Scalp in Workers Exposed to Dioxins," Lancet 2:369 (1981); Hardell, L., et al., "Malignant Lymphoma and Exposure to Chemicals, Especially Organic Solvents, Chlorophenols and Phenoxy Acids: A Case Control Study," *Br. J. Cancer* 43:169-176 (1981); Hardell, L., "Relation of Soft-Tissue Sarcoma, Malignant Lymphoma and Colon Cancer to Phenoxyacides, Chlorophenols and Other Agents," *Scand. J. Work Environ. Health* 7:119-130 (1981); Olsson, H., et al, "Non-Hodgkin's Lymphoma of the Skin and Occupational Exposure to Herbicides," *Lancet*, Sep. 12, 1981 at p. 579.

While these studies were suggestive of a causal link, they were inadequate to allow the broader scientific community to reach a consensus regarding the human carcinogenicity of the phenoxy herbicides used in Viet Nam. Welch Aff., JA 297. This was likely due to the lack of data as latency periods for cancers from agricultural exposure were just being approached. Because of the latency period between exposure to a hazardous substance and the onset of cancer, it can take decades before health effects occur, especially for lymphoid malignancies, and even longer before they are observable in studied populations. Welch Aff. JA 299.

Thus, there were enough problems with these early studies regarding sample size and exposure assessment and

classification, that while some scientists were prepared to form conclusions about the causal linkage between these chemicals and certain cancers, the scientific and medical community at large was not yet ready to embrace that conclusion.[8] *See, e.g.*, Welch Aff. JA 297.

Nevertheless, what is critical for the Court's consideration is that by 1984 there was a substantial peer reviewed body of mainstream journal articles indicating that a statistical linkage had been found between exposures to phenoxy herbicides and certain cancers. By 1984 it was also well known that the latency for carcinogenesis is often in excess of thirty years, as shown by studies finding linkages between asbestos exposure and mesothelioma, tobacco and lung cancer, and alkylating agent therapy and non-Hodgkin's lymphoma. Judge Weinstein himself recognized this when he referred to the forty years that it had taken for nuclear bomb exposures to manifest in cancers.[9] 597 F. Supp. at 795.

The bottom line is this: Given the growing number of mainstream journal articles indicating a linkage between

8. It should be noted that even by 1984 at the time the case was set for trial there were a number of very qualified scientists who were prepared to testify about the adverse health effects caused by exposure to herbicide combination in Agent Orange. JA ****.

9. The district court recognized that it was "of course, possible that in a few years a sudden increase in diseases associated with Agent Orange will be revealed." 597 F. Supp. at 795, noting that "[i]t took almost forty years for solid tissue cancers to develop in victims of atomic bombing in Japan." 597 F. Supp. at 795. Indeed, the earliest exposed veterans were only 22 years post exposure at the time of the settlement, while the most recently exposed veterans were only 13 years post-exposure. Cancer latency for environmental toxins is often well in excess of twenty years. 597 F. Supp. 783.

herbicides and cancer, and given the well known problem of long latencies for gathering enough data to form strong statistical conclusions, it was plainly incumbent on any representative or lawyer representing veterans in 1984 who had not yet developed any disease to vigorously seek to preserve future claims, to remove any potential future claimant from the settlement, or provide a basis for opting out after a disease had become manifest and the claim had accrued. Delay in litigation of a claim until a disease had actually developed would potentially allow further developments in the medicine and science to elucidate the causal linkage that was suggested at the time. Thus, Respondents' claims would likely have been preserved had a competent representative of future disease claimants been appointed, who preserved the rights of future disease claimants to litigate their Agent Orange related disease claims after they manifested. Petitioners cannot explain why future disease claimants would want to settle their unripe claims for nuisance value at best, or for nothing as in the case of Respondents, when they, unlike those already injured, could readily wait for the studies being conducted to be completed. Under the laws of the 50 states, Respondents could not have filed suit until their injuries had manifested and thus accrued under state law, and Respondents would have been protected from the running of statutes of limitations under state laws by the discovery rule. Daller, M.F., *Tort Law Desk Reference: A Fifty-State Compendium* (Aspen 2001). Indeed, some courts have invalidated statutes of repose on due process grounds where such statutes extinguished personal injury claims before manifestation of injury occurred.

II. With the Development of a Large Body of Literature during the past 20 Years as Latencies for Related Diseases Have Now Been Approached, A general Consensus now exists that Phenoxy Herbicide Exposure Is Linked to Certain Cancers, Particularly Lymphomas, including Non-Hodgkin's lymphomas, hodgkin's Lymphomas, and Multiple Myeloma.

Although Hardell and others in Scandinavia published other herbicide research before the settlement was negotiated and approved, the first notable study in the United States was a 1986 report by Dr. Sheila Hoar of the National Cancer Institute of a well designed study of farmers in Kansas which found a six-fold increased risk of NHL in farmers having exposure to herbicides which was statistically significant. Dr. Hoar also found a statistically significant dose response relationship between the number of days sprayed and the elevated risk. The risk of NHL increased to 8-fold for those who reported exposures for more than 20 days per year. Hoar, S.K., "Agricultural Herbicide Use and Risk of Lymphoma and Soft-Tissue Sarcoma," *J. Amer. Med. Assoc.* 256:1141-47.

In the next few years, the body of knowledge increased greatly. An independent review article by Morrison and others in the Journal of the National Cancer Institute, analyzing every study then published on the subject, clearly established this point. Morrison, H.I., et al., "Review: Herbicides and Cancer," *J. Nat'l Cancer Inst.* 84:1866-1874 (1992).

> The most convincing evidence suggesting that herbicides may be human carcinogens arises from studies of non-Hodgkin's lymphoma. An increased

> risk of NHL among farmers has been reported from the United States, Australia, and New Zealand.

Id. at 1866. In this review Morrison explained why the few studies which had not shown a positive linkage were not as persuasive as those that did. Morrison and his co-authors concluded:

> There is reasonable evidence to suggest that phenoxy herbicide exposure results in an increased risk of developing NHL. Most studies have revealed an elevated risk, and those that have examined dose-response relationships have usually noted statistically significant trends.

A. The Congressional Mandate to Research Agent Orange Disease and the Institute of Medicine

In response to the concerns voiced by Vietnam Veterans and their families, the scientific community, and herbicide manufacturers, Congress recognized a need for an objective scientific appraisal of the association between the increased risk of disease and exposure to Agent Orange and the other herbicides used in support of military operations in Vietnam. In 1991 Congress passed the Agent Orange Act of 1991, Pub. L. No. 102-4, § 3, 105 Stat. 11, 13-15 (codified as amended at 38 U.S.C. § 1116 (1991). Congress required the Secretary of Veterans Affairs to agree to a review of the issue by the National Academy of Sciences. Created by an Act of Congress, the National Academy of Sciences ("NAS") is a non-governmental, non-profit society of distinguished scholars with a mandate to advise the federal government on pressing scientific and technical issues. Its members are

elected by their peers from universities and the private sector, and the members serve without compensation. The National Academy of Sciences was charged with evaluating the strength of the scientific evidence as to an association between human exposure to the herbicides and suspect diseases. The NAS created a scientific review process that called for the Institute of Medicine and outside expert panelists to review the large body of scientific literature then available in order to assess the state of scientific knowledge concerning the causal relationship between the herbicide phenoxy acids used as defoliants in Viet Nam and adverse health effects, including cancer. For its Agent Orange committee, the NAS gathered a group of eminent professionals, all of whom had no conflicts of interest, and who had taken no public positions on the potential health effects of herbicides.[10]

In preparation for its report, the NAS committee conducted an exhaustive review of the available evidence — reading 6,420 abstracts, performing detailed review and analysis of 230 epidemiological studies, holding three formal public hearings, and consulting with outside experts. *See* NAS Report at xi-xiii, 735-56. In assessing the relative validity of studies, the NAS critiqued the methods of its peers and based its conclusion that there was a "positive association" between herbicide exposure and five specific diseases only on studies that eliminated chance, bias, and confounding with reasonable confidence. *Cf. Daubert v. Merrell Dow Pharmaceuticals*, 113 S. Ct. 2786, 2795-99 (1993) (proposing similar criteria). In this process, the committee considered several factors for each possible association including

---

10. *See* Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam* (National Academy Press, Washington, D.C. 1994) at pp. vii, 764-770. (hereafter "NAS Report")

its statistical strength, dose-response relation, temporal relation between exposure and onset, consistency across studies, specificity, and biologic plausibility.[11] *See* NAS Report at 238-40.

B. Conclusions of the Institute of Medicine of the National Academy Of Sciences

Based on this extensive review, the NAS committee concluded that "sufficient evidence" exists to find a "positive association" between exposure to Agent Orange and the onset of three cancers: soft tissue sarcoma,[12] non-Hodgkin's lymphoma,[13] and Hodgkin's disease.[14] *See* NAS Report at

11. Animal studies demonstrate the plausible biological mechanism of dioxin's actions. These studies establish that dioxin

> interacts with an intracellular protein called the Ah receptor [and that] this interaction appears to play a role in a number of health effects observed in animals. Because humans also have intracellular proteins identified as Ah receptors, [the] interactions [of dioxin] and [the Ah] receptors could play a role in human health effects.

NAS Report at 3.

12. Soft tissue sarcomas are a diverse group of malignant neoplasms (tumors) in the areas within and between organs. *See* NAS Report at 782.

13. Non-Hodgkin's lymphomas are a diverse group of malignant lymphomas, i.e., tumors derived from cells in the lymph nodes, but without the giant Reed-Sternberg cells which are characteristic of Hodgkin's disease. *See* NAS Report at 781.

14. Hodgkin's disease is a malignant lymphoma characterized by progressive enlargement of the lymph nodes, liver, and spleen, and by progressive anemia, which is distinguished morphologically from non-Hodgkin's lymphomas by the presence of giant cells known as "Reed-Sternberg" cells. *See* NAS Report at 780.

6-10, 475-501, 525-64, 572-74. Additionally, the NAS Agent Orange committee found evidence "suggestive"[15] of an association between the herbicides used in Vietnam and multiple myeloma.[16] *See* NAS Report at 6-10, 460-75, 512-22, 574-76.

C. The Department of Veterans Affairs' Review of the National Academy of Sciences Report

The Department of Veterans Affairs (VA), which had resisted acknowledging the dangers of Agent Orange, reviewed the NAS Report and "all other sound medical and scientific information." 38 U.S.C. § 1116(b)(2) (1991). The VA concluded that the credible evidence in favor of an association between herbicide exposure and disease is at least as strong as the credible evidence against such an association as to **und** "sufficient evidence," including NHL and four of the five diseases for which the NAS has found "suggestive evidence," including multiple myeloma. In making this determination, the Secretary of Veterans Affairs was required to consider whether the results were "statistically significant, . . . capable of replication, and [could] withstand peer review." 38 U.S.C. § 1116(b)(2) (1991).

In 1991, the VA thus concluded that a positive association exists between exposure to Agent Orange and the subsequent

15. For this category of cancers, the committee could not confidently eliminate possible chance, bias, or confounding. *See* NAS Report at pp. 6, 674-75.

16. Multiple myeloma is a cancer of specific bone marrow cells (plasma cells) characterized by tumors in the marrow of various bones; more specifically, a malignant proliferation of plasma cells derived from B lymphocytes. *See* NAS Report at 781.

development of non-Hodgkin's lymphoma and Hodgkin's disease, as well as multiple myeloma. *See* 59 Fed. Reg. 5,161-62 (1994) (proposed rule) (codified at 38 C.F.R. § 3.309 (1994)). The NAS Report thus altered the "one principle firmly embedded in [the VA's] bureaucratic mind" that "any problems suffered by veterans exposed to Agent Orange . . . were not, with the exception of chloracne, caused by the herbicide." Peter H. Schuck, Agent Orange on Trial: Mass Toxic Disasters in the Courts 24 (1986).

D. The Carcinogenicity of Dioxin

It is now established that dioxin, an admitted contaminant of the herbicides combined in Agent Orange, is a very potent poison which can cause a wide range of organ and metabolic dysfunctions. In laboratory animals dioxin has shown to be carcinogenic (causing cancer), teratogenic (causing birth defects) and mutagenic (causing genetic damage).

Dioxin is thought to be a substantial factor in the carcinogenic effect of the phenoxy herbicides it contaminates, including Agent Orange. For many years scientists questioned whether dioxin was carcinogenic to humans. However, an abundance of epidemiologic data now exists which establishes a carcinogenic effect of dioxin in humans. Most governmental agencies and scientists now accept the human carcinogenicity of dioxin.

According to the U.S. Dept. of Health and Human Services, the Public Health Service and the National Toxicology Program, dioxin "is known to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in humans, involving a combination of epidemiological and mechanistic information which indicate

a causal relationship between exposure to TCDD and human cancer." US DHHS, *Tenth Annual Report on Carcinogens* (2002).

Likewise, the International Agency for Research on Cancer of the World Health Organization has concluded that dioxin "is carcinogenic to humans." WHO and IARC, *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Polychlorinated Dibenzo-para-Dioxins and Polychlorinated Dibenzofurans* (1997) at p. 343. In making this evaluation, the IARC Working Group took into consideration the following supporting evidence: (1) 2,3,7,8-TCDD is a multi-site carcinogen in experimental animals that has been shown by several lines of evidence to act through a mechanism involving the Ah receptor; (2) this receptor is highly conserved in an evolutionary sense and functions the same way in humans as in experimental animals; and (3) tissue concentrations are similar both in heavily exposed human populations in which an increased overall cancer risk was observed and in rats exposed to carcinogenic dosage regimens in bioassays." *Id.*

III. The Cancers at Issue Here are Cancers of the Lymphopoietic System and Thus it Biologically Plausible that Herbicides Would Be Likely to Produce Cellular Injury in Each Type of Lymphoid Cell.

The Institute of Medicine of the National Academy of Sciences found that the evidence is sufficient to conclude that there is a positive causal association between exposure to "herbicides" and non-Hodgkin's lymphoma and Hodgkin's disease and that limited and suggestive evidence of an association for Multiple Myeloma exists — evidence which

Secretary Brown found the data adequate to conclude that a positive causal association exists. Since multiple myeloma is a lymphoid malignancy like non-Hodgkin's lymphoma and Hodgkin's disease, this section will discuss these three conditions together.

Human blood derives from two primary lineages: myeloid cells and lymphoid cells. Various classification systems have been devised for categorizing the different human blood cells and malignancies developing in them. When malignancies were observed in extramedullary sites (e.g., lymphatic tissue such as the thymus), they were often called lymphomas. Two major types of lymphomas were recognized: Hodgkin's lymphoma and non-Hodgkin's lymphoma. Hodgkin's lymphoma (also known as Hodgkin's disease) is a common type of lymphoma that was first described by Thomas Hodgkin in 1832 and is characterized by pathognomic giant cells which were first identified by Reed and Sternberg (so-called "Reed-Sternberg" cells). All other malignancies manifesting in lymphatic tissue were, by default, classified as non-Hodgkin's lymphomas. A subtype of non-Hodgkin's lymphoma was recognized for those malignancies manifesting at extramedullary sites in plasma cells — the disease commonly called multiple myeloma.

With advances in molecular biology, histochemistry, immunophenotypic analysis, and cytogenetics, hematologists and oncologists came to appreciate that classifying the various hematolymphopoietic malignancies by site of manifestation was inappropriate, because malignancies that were morphologically, histochemically, immunologically and cytogenetically identical were assigned different nomenclature simply because they happened to be observed

at different sites within the hematolymphopoietic system (e.g., small B-cell lymphoma = chronic lymphocytic leukemia).

A major advance in understanding lymphoid malignancies was the recognition of three major lymphoid cell lines: B cells, T and NK cells, and the Reed-Sternberg cell. These lymphoid cell lineages are all related and thought to derive from differentiation of a common pluripotent stem cell. The diseases commonly referred to as non-Hodgkin's lymphomas are now classified as various malignancies based upon their cell of origin, a host of morphologic, histochemical, immunologic, immunophenotypic and cytogenetic characteristics, and the degree of maturity of the malignant clone.

The most recent classification of these diseases is that of the World Health Organization published by the International Agency for Research on Cancer in 2001.[17] According to this classification system, lymphomas are now classified as B-Cell Neoplasms, T-Cell and NK-Cell Neoplasms, and Hodgkin Lymphomas. Most of the diseases previously categorized as non-Hodgkin's lymphomas are now classified as "Mature B-cell Neoplasms," a category of 17 identified diseases which includes Plasma Cell Myeloma — the new nomenclature for multiple myeloma.

In sum, these diseases are all malignancies of lymphoid lineage, are thought to be derived from a common stem cell, are biologically similar, develop from cellular damage, have

17. The WHO Classification System is based on the principles defined in the "Revised European-American Classification of Lymphoid Neoplasms" (REAL) classification, originally published by the International Lymphoma Study Group (ILSG) in 1994.

common risk factors and etiologies. For all these reasons, what have in the past commonly been referred to as non-Hodgkin's lymphomas, Hodgkin's lymphomas, and multiple myelomas are all related malignancies[18] which are appropriately evaluated together in assessing causality and etiology.

These diseases are also often grouped together in epidemiologic studies, not only because of their many

18. In the initial review of literature and assessment of the causal association between Agent Orange and malignant lymphomas, the Institute of Medicine recognized both the common features of these malignancies and the propriety for considering them together under the rubric of malignant lymphomas:

> The malignant lymphomas are a group of morphologically related neoplasms derived from lymphoreticular cells in lymph nodes, bone marrow, spleen, liver or other sites in the body such as the skin, intestine, and lung. The common stem cell origin in lymphoreticular tissue in lymph nodes and extranodular tissues underscores their unity despite a plethora of histologic and immunologic cell subtypes. Significant microscopic characteristics important for treatment and prognosis are the basis for separating the lymphomas into Hodgkin's disease (HD; ICD 201.0-201.9), non-Hodgkin's lymphomas (NHL: ICD-9 200.0-200.8, 202.0-202.2, 202.8-202.9), and multiple myeloma (MM; IC-9 203.0, 203.2-203.8).

Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam* (National Academy Press, Washington, D.C. 1994) at pp. 525-526.

commonalities, but because doing so is often necessary for such studies to achieve statistical power.[19]

A. The Epidemiology of Herbicide-Induced Non-Hodgkin's Lymphoma

Among the strongest causal associations for Agent Orange and disease is that for the collection of malignancies which were until recently classified as "non-Hodgkin's lymphomas." A causal association for non-Hodgkin's lymphoma was initially found by the Institute of Medicine in 1994,[20] was corroborated in its 1996 update,[21] was

19. Epidemiology is too insensitive an analytic tool to assess causality of the many subtypes of lymphomas recognized under the REAL and WHO classification systems, because the many cell subtypes are so rare that epidemiologic studies cannot be designed to study them and still have sufficient statistical power — which is critical for the scientific validity of any epidemiologic study. It is therefore not surprising that positive associations in multiple epidemiologic studies evaluating exposure to Agent Orange have been demonstrated for non-Hodgkin's lymphomas, Hodgkin's disease and multiple myeloma. Since multiple myeloma is a much rarer malignancy than Hodgkin's disease and the group of all other non-Hodgkin's lymphomas combined, it is also not surprising that odds ratios for multiple myeloma are increased similarly to these other disease categories, but that the results often do not achieve statistical significance for lack of sufficient statistical power to detect a significant increase in such a rare disease.

20. Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam* (National Academy Press, Washington, D.C. 1994).

21. Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion (Cont'd)

confirmed in its 1998 update,[22] and was reconfirmed in its 2000 update.[23]

The 2000 Update of the Institute of Medicine tabulated a total of 47 occupational cohort epidemiologic studies relevant to causality of non-Hodgkin's lymphoma from Agent Orange. Of these, 26 studies were first evaluated in the Institute's initial monograph, 12 studies were evaluated in the 1996 update, 7 studies were evaluated in the 1998 update, and 2 studies were evaluated in the 2000 update.[24] Since the 2000 update, at least three more occupational studies have been published.[25] Of these

(Cont'd)
and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 1996* (National Academy Press, Washington, D.C. 1996).

22. Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 1998* (National Academy Press, Washington, D.C. 1999).

23. Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 2000* (National Academy Press, Washington, D.C. 2000).

24. Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 2000* (National Academy Press, Washington, D.C. 2000).

25. Thörn, Ä., et al., "Mortality and cancer incidence among Swedish lumberjacks exposed to phenoxy herbicides," *Occup. Environ.*
(Cont'd)

50 studies, all but three reported increased risks of non-Hodgkin's lymphoma among the exposed cohorts. In approximately 18 of the studies the increased risk of disease was statistically significant to a 95% confidence interval for non-Hodgkin's lymphoma. In none of the studies was a significant deficit of non-Hodgkin's lymphoma reported. Thus, the multiple occupational epidemiology studies regarding phenoxyacetic herbicides are quite consistent in demonstrating an increased risk of non-Hodgkin's lymphoma in workers exposed to these herbicides and, hence, Agent Orange. That more than one-third of the studies yielded significant positive results and no studies reported negative significant results is strong evidence that exposure to phenoxyacetic herbicides, Agent Orange, and dioxin, is causative of non-Hodgkin's lymphoma.

B. The Epidemiology of Herbicide-induced Multiple Myeloma

Multiple myeloma is cancer of plasma cells and is characterized by tumors of these cells in various bones of the body. Myeloma is a bone-destroying tumor. This cancer can (and often does) develop at the same time in many locations of the body (thus, multiple). Myeloma causes large areas of destruction of the bone. The tumor occurs most often in the ribs, vertebrae, pelvic bones, and flat bones of the skull. Intense pain and fractures are common.

(Cont'd)
Med. 57:718-720 (2000); Burns, C.J., et al., "Mortality in chemical workers potentially exposed to 2,4-dichloro-phenoxyacetic acid (2,4-D) 1945-94: an update," *Occup. Environ. Med.* 58:24-30 (2001); McDuffie, H., "Non-Hodgkin's Lymphoma and Specific Pesticide Exposures in Men: Cross-Canada Study of Pesticides and Health," *Cancer Epidemiology, Biomarkers & Prevention* 10:1155-1163 (2001).

In its initial evaluation of the epidemiologic literature, the Institute of Medicine found "limited/suggestive evidence" of an association between herbicide exposure and the development of multiple myeloma. In its summary regarding multiple myeloma, the Institute of Medicine wrote:

> Multiple myeloma has been less extensively studied than other lymphomas, but a consistent pattern of elevated risks appears in the studies that have been conducted. . . . Ten studies of agricultural and forestry workers provide information on MM risk in relation to herbicide or pesticide exposure. All demonstrated an odds ration or SMR greater than 1.0; seven did so at a statistically significant level. However, two did not demonstrate an increase over the odds ration for farming when specification of herbicide or pesticide use was added, and two demonstrated a relatively flat exposure-response relation. Such limitations in some studies are to be expected, however, given the small number of MM cases with herbicide exposure. The committee determined that the evidence for this association was limited/suggestive because the individuals in the existing studies — mostly farmers — have, by the nature of their occupation, probably been exposed to a range of potentially carcinogenic agents other than herbicides and TCDD.

Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Health Effects of Herbicides Used in Vietnam* (National Academy Press, Washington, D.C. 1994) at pp. 562-563.

However, the Institute of Medicine also noted that "[t]he finding of an association between exposure to phenoxy acids or TCDD and Hodgkin's disease and non-Hodgkin's lymphoma in humans strengthens the suggestive evidence for an association between multiple myeloma and exposure to phenoxy acids." *Id.* at 563.

In reviewing the conclusion of the Institute of Medicine, the Veterans Administration found the evidence concerning multiple myeloma convincing because (1) most of the studies reviewed by the Institute showed an increased (although in most cases nonsignificant) risk, and (2) multiple myeloma is closely related biologically to B-cell non-Hodgkin's lymphoma so that the epidemiological evidence concerning non-Hodgkin's lymphoma gives added weight to the association between herbicide exposure and multiple myeloma. Based on this clinical consideration and the weight of the epidemiological evidence, Secretary Brown concluded that there is a positive association between herbicide exposure and multiple myeloma that manifests itself to a degree of ten percent at any time after exposure.

The 2000 Update of the Institute of Medicine tabulated a total of 24 occupational cohort epidemiologic studies relevant to causality of multiple myeloma from Agent Orange. Of these, 12 studies were first evaluated in the Institute's initial monograph, 7 studies were evaluated in the 1996 update, 3 studies were evaluated in the 1998 update, and 2 studies were evaluated in the 2000 update.[26] Of the 24 studies

26. Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides; Division of Health Promotion and Disease Prevention, Institute of Medicine, National Academy of Sciences, *Veterans and Agent Orange: Update 2000* (National Academy Press, Washington, D.C. 2000).

in the 2000 Update, all but 2 reported increased risks of multiple myeloma disease among the exposed cohorts. In about half of the studies the increased risk of disease was statistically significant to a 95% confidence interval for multiple myeloma. In none of the studies was a significant deficit of multiple myeloma reported. Thus, the multiple occupational epidemiology studies regarding phenoxyacetic herbicides are consistent in demonstrating an increased risk of multiple myeloma in workers exposed to these herbicides and, hence, Agent Orange. That half the studies showed significant positive results and none reported negative significant results is strong evidence that exposure to phenoxyacetic herbicides and Agent Orange causes multiple myeloma.

Since multiple myeloma is a subtype of non-Hodgkin's lymphoma, since it along with certain non-Hodgkin's lymphomas has recently been reclassified by the International Agency for Research on Cancer as a mature B-cell neoplasm, since non-Hodgkin's lymphoma and Hodgkin's disease have been accepted as diseases caused by exposure to herbicides, since most epidemiologic studies lack sufficient statistical power to yield significant results for particular subtypes of cancers, it is now reasonable to conclude that a causal association does exist for exposure to phenoxy herbicides and multiple myeloma, as Secretary Brown concluded in reviewing the initial report of the Institute of Medicine.

CONCLUSION

Advances in medical science during the past twenty years have shown that the causal association between herbicide exposure and Non-Hodgkin's Lymphoma and Multiple Myeloma have proven to be genuine. Respondents, who suffer from these lymphoid malignancies, were not adequately represented in the class action, because no legal representative was appointed to represent their interests. Had a legal representative who was competent and had no conflicting interests been appointed to represent Respondents in the settlement, such a legal representative would have recognized that advances in medical science with the passage of time would only benefit future disease claimants such as Respondents, and, in the discharge of his or her fiduciary duty to this class of claimants, would have litigated vigorously to protect their interests and would have preserved their claims to be litigated in the future when their diseases manifested and, coincidentally, the science to prove the cause of their diseases was mature. Since Respondents' interests were not adequately represented in the class action settlement, the judgment of the Second Circuit should be affirmed.

Respectfully submitted,

RAPHAEL METZGER
LAW OFFICES OF RAPHAEL METZGER,
A PROFESSIONAL LAW CORPORATION
Attorneys for Amici Curiae
401 East Ocean Boulevard
Suite 800
Long Beach, CA 90802
(562) 437-4499

APPENDIX

Carl F. Cranor is Professor of Philosophy and Associate Dean of Humanities, Arts and Social Sciences at the University of California, Riverside. He is the author of *Regulating Toxic Substances: A Philosophy of Science and the Law* (1993) and editor of *Are Genes Us? The Social Consequences of the New Genetics (1994).* Dr. Cranor has published extensively regarding risk assessment.

Devra Davis is a former Scholar in Residence at the National Academy of Sciences and member of the National Chemical Safety and Hazard Investigation Board. She is now Visiting Professor of Public Policy at Carnegie Mellon University's Heinz School and Senior Advisor to the World Health Organization.

Peter L. deFur is an Affiliate Associate Professor in the Center for Environmental Studies at Virginia Commonwealth University where he conducts research on environmental health and ecological risk assessment. Dr. deFur is chair of the Board of the Science and Environmental Health Network, President of the Association for Science in the Public Interest, and recently completed a term on the National Research Council Board on Environmental Studies and Toxicology. Dr. deFur has served on numerous scientific reviews of EPA ecological and human health risk assessments.

Brian G. Durie is a physician who has devoted his life to the study of multiple myeloma. He developed the Durie/ Salmon Staging System, a set of criteria which is used throughout the world to determine the severity and progression of multiple myeloma. Dr. Durie serves as Chairman of the Board of the International Myeloma

Foundation and Director of its Scientific Advisory Board. He has contributed more than 250 articles regarding multiple myeloma to the medical literature.

Alan H. Lockwood, M.D., is Professor of Neurology and Nuclear Medicine at the University at Buffalo. Dr. Lockwood has published extensively regarding causal associations between pesticides and various neurological disorders.

David Ozonoff, M.D., M.P.H. is a physician and epidemiologist specializing in the study of diseases caused by exposure to toxic chemicals and other environmental agents. He is a Professor of Public Health and Chair of the Department of Environmental Health in the School of Public Health at Boston University. He has published extensively regarding the toxic effects of pesticides.

Arnold J. Schecter, M.D., M.P.H., serves as Professor of Environmental Sciences in the School of Public Health at the University of Texas at Houston. Dr. Schecter served as Peer Reviewer for the Agency for Toxic Substances and Disease Registry, Centers for Disease Control, US Public Health Service, for their Toxicological Profile for Chlorinated Dibenzo-p-dioxins in 1991-92. Dr. Schecter has testified before the U.S. Congress House Sub-Committee Government Operations concerning Agent Orange, Dioxins and has served as Advisor to the World Health Organization of the United Nations on Chlorinated Dioxins and Related Chemicals in Human Breast Milk.

David Wallinga, M.D., MPA, is a physician affiliated with The Institute for Agriculture and Trade Policy. He has written on the health effects of pesticides, as well as the limitations of testing of pesticides.

Lymphoma Foundation of America (LFA) is the national organization devoted solely to lymphoma patients and their families. LFA has a strong interest in the causes of lymphoma; it has conducted a survey of worldwide medical and scientific literature on the link between pesticides and lymphoma, and has published a research report titled *Do Pesticides Cause Lymphoma?* (Lymphoma Foundation of America 2001) which is available on the internet at http://www.lymphomahelp.org/docs/research/researchreport/introduction.pdf.